

## SUMMARY OF THESIS\*

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### STUDY OF HUMORAL RESPONSE TO *PLASMODIUM* ANTIGENS OF PANARA INDIANS (EX KREN-AKORORE). BRAZIL-CENTRAL

Many of Brazilian Indians live in areas where malaria is endemic, which is one of the most important causes of high mortality and morbidity.

In 1973, Panará Indians were first contacted near the river Peixoto de Azevedo, north of the state of Mato Grosso, where around 135 and 140 Indians had been counted. In 1975, they were only 79 Indians and were transferred to Xingu Indigenous Park (XIP) trying to avoid reaching their vanishing point. The Panará suffered frequent, severe attacks of malaria during their first weeks in the XIP. Clinical and laboratory tests revealed that all of them had antibodies to *Plasmodium vivax* antigen and had palpable spleen quite often very enlarged spleen (index of Hackett >3). During 20 years they moved several times to different regions inside the XIP.

In this work we studied the humoral immune response to *Plasmodium* antigens of the Panará Indians in 1991 (n=48) and 1998 (n=76), being 38 blood samples collected from the same persons in both dates (paired samples). In order to compare the profile of the Indians serological responses we studied a group of 51 gold miners, with well-defined malaria clinical and laboratory conditions, and living under different malaria epidemiological situation compared to the ones the Indians have lived under. The research for IgG and IgM antibodies against blood stages of *P. falciparum* antigens were detected by ELISA and Western blotting, and we also studied the avidity of IgG antibodies by both techniques. The blood stage antigen was obtained from the *P. falciparum in vitro* culture and extracted with amphoteric detergent. The IgG antibody avidity was determined by urea 8M washing after the serum incubation stage. By the Western blotting technique we tried to identify antigenic bands that permit to differentiate recent and past malaria infections and to analyze the homogeneity of the Indians immune responses.

We also detected IgG antibodies against circumsporozoite protein (CSP) of *P. falciparum*, *P. vivax* and *P. malariae* using specie-specific synthetic peptides in ELISA.

The results showed a significant decrease in the IgG and IgM antibody frequencies among serum samples collected in 1991 and 1998, 100%

versus 61.8% for IgG antibodies, and 93.8% versus 40.7 for IgM antibodies.

The mean avidity index of IgG antibodies also decreased from 1991 to 1998 (70.7% versus 63.6%), since in 1991 all of the IgG antibodies presented high avidity and in 1998, 19.1% of them presented medium avidity. The antibodies frequency decreasing was correlated with clinical observations, since in 1991, 38% of the Indians had still palpable spleen while in 1998 no Indians had fever or palpable spleen. The frequencies of IgG and IgM antibodies in gold miners with patent parasitaemia of *P. falciparum* were 94.4% and 33.3% respectively, with predominance of high avidity IgG antibodies (88%) and in gold miners without parasitaemia were 97.0% and 54.4%, IgG and IgM antibodies, respectively, with predominance of high avidity IgG antibodies (78%).

We observed a homogeneous scattering in the reactivity index of Indians IgG antibodies in ELISA, different from what was observed in the gold miners' results. This shows that the genetic background and exposure to same variants of *P. falciparum* since Indians birth induce similar immune response pattern; what was also observed in the reactivity of Indian sera against different *P. falciparum* protein bands in Western blotting.

The frequency of anti-CSP antibodies of the three *Plasmodium* species also decreased between the two collecting times.

Our results showed a decrease of malaria endemicity, probably because of the differences of the malaria transmission on the two regions where they were living. Even if it was lower in 1998 compared to 1991, the transmission persists, what could be confirmed by observing the predominance of low avidity IgG antibodies in Indians serum samples, which were collected only in 1998. The predominance of low avidity IgG antibodies against the 46 kDa protein band was also observed in Indian sera samples collected in 1998, similar to what was observed concerning the gold miners having positive parasitaemia, and could be suggesting the occurring of patent infections among the Indians when in 1998.

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